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For: Multimeter with Non-Contact Temperature Measurement

CLAIMS

- 1 1. A multimeter with non-contact temperature measurement capability, comprising:
2 a multimeter contained in a housing and having outputs relating to measured
3 electrical parameters;
4 an output display contained in the housing, for displaying results to a user;
5 a non-contact optically-based temperature sensing device coupled to the housing,
6 having an output related to sensed temperature; and
7 circuitry contained in the housing for processing both the multimeter outputs and
8 the temperature sensing device output, and transmitting the processed output to the output
9 display.
- 1 2. The multimeter with non-contact temperature measurement capability of claim 1
2 in which the multimeter is a digital multimeter.
- 1 3. The multimeter with non-contact temperature measurement capability of claim 1
2 in which the temperature sensing device comprises an infrared sensor.
- 1 4. The multimeter with non-contact temperature measurement capability of claim 3
2 in which the temperature sensing device further comprises a lens, proximate the infrared
3 sensor, for focusing entering radiation and protecting the infrared sensor.
- 1 5. The multimeter with non-contact temperature measurement capability of claim 1
2 in which the temperature sensing device defines a sense axis that is fixed relative to the
3 housing.

1 6. The multimeter with non-contact temperature measurement capability of claim 1
2 in which the temperature sensing device defines a sense axis that is adjustable relative to
3 the housing.

1 7. The multimeter with non-contact temperature measurement capability of claim 6
2 in which the temperature sensing device is mounted in a mount that is coupled to and
3 movable relative to the housing, to allow the user to aim the temperature sensing device.

1 8. The multimeter with non-contact temperature measurement capability of claim 7
2 in which the temperature sensing device mount is rotatably coupled to the housing.

1 9. The multimeter with non-contact temperature measurement capability of claim 1
2 further comprising an optical aiming device coupled to the housing, to assist the user in
3 aiming the temperature sensing device at an object whose temperature is to be measured.

1 10. The multimeter with non-contact temperature measurement capability of claim 9
2 in which the optical aiming device defines an aiming axis that is adjustable relative to the
3 housing.

1 11. The multimeter with non-contact temperature measurement capability of claim 10
2 in which the optical aiming device is mounted in a mount that is coupled to and movable
3 relative to the housing, to allow the user to aim the optical aiming device.

1 12. The multimeter with non-contact temperature measurement capability of claim 11
2 in which the optical aiming device mount is rotatably coupled to the housing.

1 13. The multimeter with non-contact temperature measurement capability of claim 9
2 in which the optical aiming device comprises a diode laser device.

1 14. The multimeter with non-contact temperature measurement capability of claim 1
2 further comprising a switch for switching at least some of the circuitry between the
3 multimeter outputs and the temperature sensing device output.

1 15. The multimeter with non-contact temperature measurement capability of claim 1
2 further comprising a user-operable electrical device for selectively routing the
3 temperature sensing device output to the circuitry.

1 16. The multimeter with non-contact temperature measurement capability of claim 1
2 further comprising a user-operable electrical device for selectively holding the sensed
3 temperature.

1 17. The multimeter with non-contact temperature measurement capability of claim 1
2 in which the circuitry determines the sensed temperature based on the output of the
3 temperature sensing device using a fixed emissivity.

1 18. The multimeter with non-contact temperature measurement capability of claim 17
2 in which the fixed emissivity is less than one.

1 19. A digital multimeter with non-contact temperature measurement capability,
2 comprising:

3 a digital multimeter contained in a housing and having outputs relating to
4 measured electrical parameters;

5 a digital output display contained in the housing, for displaying results to a user;

6 a non-contact infrared temperature sensing device within the housing, having an
7 output related to sensed temperature; and

8 circuitry contained in the housing for processing both the multimeter outputs and
9 the temperature sensing device output, and transmitting the processed output to the output
10 display.

1 20. The multimeter with non-contact temperature measurement capability of claim 19
2 in which the temperature sensing device defines a sense axis that is adjustable relative to
3 the housing.

1 21. The multimeter with non-contact temperature measurement capability of claim 20
2 in which the temperature sensing device is mounted in a mount that is coupled to and
3 movable relative to the housing, to allow the user to aim the temperature sensing device.

1 22. The multimeter with non-contact temperature measurement capability of claim 21
2 in which the temperature sensing device mount is rotatably coupled to the housing.

1 23. The multimeter with non-contact temperature measurement capability of claim 19
2 further comprising an optical aiming device coupled to the housing, to assist the user in
3 aiming the temperature sensing device at an object whose temperature is to be measured.

1 24. The multimeter with non-contact temperature measurement capability of claim 23
2 in which the optical aiming device defines an aiming axis that is adjustable relative to the
3 housing.

1 25. The multimeter with non-contact temperature measurement capability of claim 24
2 in which the optical aiming device is mounted in a mount that is coupled to and movable
3 relative to the housing, to allow the user to aim the optical aiming device.

1 26. The multimeter with non-contact temperature measurement capability of claim 25
2 in which the optical aiming device mount is rotatably coupled to the housing.

1 27. The multimeter with non-contact temperature measurement capability of claim 19
2 in which the circuitry determines the sensed temperature based on the output of the
3 temperature sensing device using a fixed emissivity.

1 28. The multimeter with non-contact temperature measurement capability of claim 27
2 in which the fixed emissivity is less than one.